

CONTRIBUTION TO OUR KNOWLEDGE OF AMERICAN THYSANOPTERA.

BY DUDLEY MOULTON, San Francisco, California.

Two species, namely *Taeniothrips dianthi*, Pr. and *Thrips discolor*, Halid. and the three genera, *Lispthrips*, Reut., *Thorybothrips*, Pr., and *Docessisophothrips*, Bagnall represented herewith by new species, are now recorded from North America for the first time. The distribution of five known American species is extended into new territory. In all, twelve new species and the male of *Thrips (Microcephalothrips) abdominalis*, Crawford are described in this paper.

TEREBRANTIA, 1836

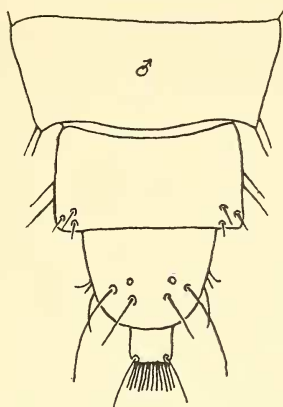
Family OROTHRIPIDAE Bagnall

Erythrothrips fasciculatus n. sp. (Fig. 1).

Female, holotype. Body color dark brown with red pigment. Antenna uniformly dark brown except segment three which shades gradually from brownish yellow at base to yellowish brown at tip. Fore wings colored as in *arizonae* Moulton, whitish in anterior half with a dark brown longitudinal band in posterior half. This band extends from extreme base of wing including scale and is a little broader near center of wing.

Total body length 2.2 mm.; head, length .27 mm., width .19 mm.; prothorax, length .21 mm., width .22 mm.; mesothorax, width .36 mm.; length of ninth abdominal segment .18 mm., width at base .22 mm. Segments of antennae: length (width) III, 93 (27); IV, 84 (27); V, 57 (27); VI, 54 (25) VII, 63 (24); VIII, 24; IX, 15; total length 470 microns. Length of spines on ninth abdominal segment 240 μ , length of spines on tenth abdominal segment 225 μ . Sense areas on antennal segment III, 16 μ , IV, 30 microns.

Male, allotype. Total body length 1.5 mm.; head, length .18 mm., width .18 mm.; prothorax, length .165 mm., width .20 mm.; mesothorax, width .28 mm. Length of ninth abdominal segment .06 mm., width .12 mm. Segments of antennae: length (width) I, 27 (32); II, 48 (30); III, 87 (24); IV, 72 (26); V, 57 (24); VI, 57 (24); VII, 60 (24); VIII, 24; IX, 12; total length 440 microns. Spines on tenth abdominal segment, outer 120 μ , inner 82 microns. Sense areas on antennal segments III, 15, 9 μ ; IV, 30, 21 microns of first and second paratypes.



Erythrothrips fasciculatus.

Type Material: Female holotype, male allotype, ten ♀ and three ♂ paratypes taken on *Adenostoma fasciculatum*, yellow clover, and California sage. Types in author's collection. (Moulton, Nos. 699, 713, 735, 1744, 2782, 2784 and 2984.)

Type Locality: California.

This species has the general color and appearance of *E. arizonae* Moulton, but may be readily distinguished from it by the following characters: a gradual shading of the third antennal segment rather than an abrupt change of color in the middle as in *arizonae*; the smaller third and fourth antennal segments, and the much smaller sense area in segment three, 13-16 μ , as compared to approximately 60 μ , in *arizonae*.

The most striking difference, however, is found in the male. In this new species the last three abdominal segments are much shorter and broader and the eighth segment has two spines at each posterior angle and a series of vestigial hairs at the sides, and the ninth segment has two spines in the middle of each side. In *arizonae* segment eight has an arrangement of ten to twelve long, evenly placed hairs extending almost the full length of the segment and segment nine has three or four long hairs at the side.

Erythrothrips bishoppi n. sp.

Female, holotype. Body color dark blackish brown except third antennal segment which is yellow in basal third, shading rather gradually to dark brown in outer third. Fore wings whitish in anterior half and dark brown in posterior half, extending to extreme base, including scale.

Total body length 2.33 mm.; head, length .18 mm., width .21 mm.; prothorax, length .21 mm., width .25 mm.; mesothorax, width .54 mm. Length of ninth abdominal segment .165 mm., width at base .21 mm.; fore wings, width in middle, .165 mm. Segments of antennae: length (width) I, 45 (42); II, 69 (39); III, 105 (30); IV, 99 (33); V, 69 (30); VI, 69 (30); VII, 60 (27); VIII, 30 (18); IX, 15; total length 510 microns. Length of spines: on ninth abdominal segment 240 μ , on tenth abdominal segment 255 μ . Number of spines on costa 60, fore vein 34, hind vein 26. Maxillary palpi with 7, labial palpi with 4 segments. Sense areas on antennal segments III, 33; IV, 66 microns.

Type Material: Female holotype taken on black walnut, April 13, 1927 (F. C. Bishopp), and named in honor of the collector. Types in author's collection. (Moulton, No. 2171.)

Type Locality: Sonora, Texas.

This species has the general appearance of *E. arizonae* Moulton, but may be separated from it by the shorter and broader head. In *bishoppi* the head is wider than long, while in *arizonae* it is noticeably longer than wide, third and fourth antennal segments are shorter, 133 μ and 120 μ in *arizonae* as compared with 103 μ and 100 μ in this species. The colored band on the fore wings is of nearly uniform width along posterior half and noticeably darker than in *arizonae*. The sixth to ninth abdominal segments gradually decrease in size, while in *arizonae* the eighth abdominal segment is rather more abruptly narrowed.

***Erythrotrips keeni* n. sp.**

Female, holotype. Body color blackish brown except third antennal segment which is abruptly yellowish brown in basal two-thirds and fourth to sixth abdominal segments which are somewhat lighter. Basal third of fore wings whitish except for the dark brown scale, distal two-thirds with a dark longitudinal band along posterior margin, broadening somewhat in the middle and at tips.

Total body length (abdomen distended) 2.37 mm.; head, length .25 mm., width .216 mm.; prothorax, length .216 mm., width .266 mm.; pterothorax, width .40 mm.; length of ninth abdominal segment along median dorsal line .183 mm., of tenth .166 mm. Segments of antennae: length (width) I, 51 (45); II, 60 (36); III, 141 (33); IV, 112 (33); V, 75 (30); VI, 72 (30); VII, 69 (30); VIII, 33 (18); IX, 18; total length 630 microns. Spines on ninth abdominal segment 291 μ , on tenth 270 μ . Sense areas on antennal segments III, 48-48 μ , IV, 63-69 microns.

Male allotype: Colored as in female.

Total body length (abdomen normal) 1.66 mm.; head, length .216 mm., width .183 mm.; prothorax, length .183 mm., width .20 mm.; pterothorax, width .25 microns. Antennae broken off.

This species is very similar to *E. arizonae* Moulton, especially in the color of the third antennal segment but is distinctly different in the coloring of the fore wings, being light colored in the basal third except for scale, while in *arizonae* the dark longitudinal band is continued from extreme base to tip of wing. The difference between the two species is more readily noted in the arrangement of hairs and spines on the seventh, eighth and ninth abdominal segments of the ♂, especially on the eighth and ninth segments. In *arizonae* the seventh segment has a group of four or five rather prominent spines at the sides near the back and on the posterior angles, the longest of these spines at the angles is about 54 μ long. The eighth segment has a series of about twelve long hairs (75 μ) along the sides and distributed evenly from near anterior margin to posterior margin. In *keeni* Moulton there is a group of about twelve hairs arranged in two or three rows and placed at the sides in the third quarter of the seventh abdominal segment. There are no spines at the anterior half but on either side of the posterior angle there is a group of about twelve short dark spur-like bristles. There is a similar group of about twelve hairs on posterior third. In *fasciculatus* Moulton there is a darker colored, slightly enlarged swelling on either side near the posterior margin of segment seven which bears a group of several very short inconspicuous hairs, the eighth segment has two or three short spines at each posterior angle but is without the conspicuous series of long hairs at the sides.

Type Material: Female holotype, male allotype and one paratype taken on *Chrysolamus*, August 15, 1927, by F. P. Keen and named in his honor. Types in author's collection. (Moulton, No. 2515.)

Type Locality: Bly, Oregon.

I am also placing in this species two female specimens, one taken by the writer on *Mentzelia laevicaulis*, July 31, 1926, at Markleyville, and one in blossoms of White Yarrow at Everett Pass, Alpine County, California, on the same date. (Moulton, Nos. 963 and 964.)

Family HETEROTHRIPIDAE Bagnall.

Heterothrips auranticornis Watson.

Two female specimens taken on *Helianthus decapetalus*, September 4, 1927, in Yankton County, South Dakota, by Mr. A. W. Larrabee. (Moulton, No. 2629.) This extends the habitat of the species into the Rocky Mountain States.

Heterothrips gillettei n. sp.

Female holotype: Body color dark chestnut brown with diffused orange pigmentation. All femora, middle and hind tibiae uniformly dark brown, fore tibiae lighter, shading to yellowish in center and at tips, fore tarsi yellowish, middle and hind tarsi light brown. Antennal segment two dark brown, concolorous with head, one lighter brown, three yellow, colored brown in distal fourth, fore to nine brown with four slightly lighter at tip where sensoria are placed. Wings uniformly brown.

Total body length 1.36 mm.; head, length .133 mm., width .14 mm.; prothorax, length .133 mm., width .216 mm.; mesothorax, width .26 mm. Antennae: length (width) I, 21 (30); II, 36 (27); III, 51 (24); IV, 42 (21); V, 30 (18); VI, 30 (18); VII, 22 (12); VIII, 18 (10); IX, 21; total length 270 microns. Median dorsal spines on seventh and eighth abdominal segments 60 μ , on ninth and tenth 51 microns.

Head as long as wide, with deep crescent-shaped pits in front which receive the basal segments of antennae. Anterior margin of eyes sharply protruding. Antennae placed close together, not over 9 mm. apart. Cheeks very slightly arched, back of head with coarse striations. All head spines small. Eyes with coarse facets. Anterior ocellus small, directed forward, posterior ocelli large, contiguous with inner margins of eyes, three to four times greater in diameter than facets of eyes. Mouth cone short and blunt. Antenna twice as long as head, segment two widest, three longest, three and four with bands of sensoria at distal ends.

Prothorax as long as head, 1.6 wider than long, without prominent spines, with broadly rounded posterior angles and margin. Pronotum faintly reticulate, sculptured with fine dots within the reticulations. Setae scattered. Mesothorax broadest, metathorax smaller with posterior angles rounded to union with abdomen. Legs fairly stout. Wings fully developed, with spines as follows: costa, 1-32, fore vein 23, hind vein 18.

Abdomen elongate-ovate with a pair of closely placed median dorsal spines on segments two to eight, posterior margins of segments one to five bordered with a fringe of spines at the sides which are placed singly and not joined into plates. The posterior margin of segment one without spines in the center but two to five inclusive with a center fringe of four or five spines, this fringe complete on segments six, seven and eight. Dorsal surface of all segments indistinctly reticulate and sparingly setose at the sides.

Male allotype. Colored as in the female but with antennal segment four also somewhat lighter, especially at the tip.

Total body length 1.08 mm.

Abdominal sternites without ventral depressions. Wings fully developed.

Type Material: Female holotype, male allotype, 8 ♀♀, 6 ♂♂ paratypes taken on "rat-tail weed" (Moulton, No. 1037) and yellow sweet clover (Moulton, No. 1027), July 10, 1926 (Prof. C. P. Gillette), and named in honor of the collector. All types in author's collection.

Type Locality: Fort Collins, Colorado.

This species belongs in that group in which the abdominal tergites are fringed posteriorly with hairs which are not coalesced into plates. It is most closely related to *H. auranticornis* Watson, but may be separated by the following characters: *gillettei* has all femora and middle and hind tibiae uniformly brown, antennal segments four, five and six brown, with four only a shade lighter, especially in the male. In *auranticornis* the tips of fore femora, both ends of middle and hind femora and tibia are brownish yellow, antennal segments three and four are yellow, conspicuously shaded with orange, five is yellow in basal two-thirds and six in basal half.

Family THIRIPIDAE Uzel.

Subfamily *Heliothripinae* Karny.

***Heliothrips bishoppi* n. sp.**

Female holotype: Color dark chestnut brown. Antennal segments one, two and six to eight concolorous with head, three and four brownish yellow at both ends, darker in the middle, five brownish yellow in basal third shading to dark brown in distal two-thirds. Fore femora and tibia brownish yellow but darker in the middle, middle and hind femora dark brown, middle and hind tibia yellowish at both ends, dark brown in the middle, all tarsi yellow. Wings clear except for a dark cross band at forking of veins which is continued into

a longitudinal band along posterior margin and broadened again to form a dark band at tip.

Total body length 1. mm.; head, length .10 mm., width .15 mm.; prothorax, length .116 mm., width .17 mm.; pterothorax, width .25 mm. Antennae: length (width) III, 45 (21); IV, 48 (22); V, 39 (21); VI, 27 (18); VII, 15; VIII, 30; total length of segments III to VIII 240 microns.

This species is very similar to *H. punctipennis* Hood, but may be easily separated from that species by the color of the legs which are clear lemon yellow, in *bishoppi* the middle and hind legs are distinctly dark brown but brownish yellow at the joints.

Type Material: Female holotype taken on *Quercus* sp., April 17, 1927 (F. C. Bishopp), and named in honor of the collector. Holotype in author's collection. (Moulton, No. 2177.)

Type Locality: Menard, Texas.

Subfamily SERICOTHRIPINAE Karny.

Tribe *Sericothripini* Priesner, 1926.

Sericothrips langei n. sp.

Female holotype. Color dark brown, pterothorax somewhat lighter. Antennal segments one to four whitish yellow with the first segment slightly brownish, five whitish yellow at base, gradually shading to brown at tip, six to eight brown. All femora brown but yellowish at base, all tibiae brownish in basal halves yellowish in distal halves, tarsi yellow. Fore wings clear at base, middle and tip, with two intervening brown bands. Crescents of ocelli orange red.

Total body length 1 mm.; head, length .09 mm., width .165 mm.; prothorax, length .12 mm., width .18 mm.; pterothorax, width .24 mm.; abdomen, width .24 mm. Segments of antennae: length (width) I, 15 (24); II, 30 (24); III, 39 (18); IV, 36 (17); V, 33 (16); VI, 45 (18); VII, 9; VIII, 12; total length 222 microns. Length of spines: interocellars 21 μ , on posterior angles of prothorax 30 μ , on posterior angles of ninth abdominal segment 51 μ , on tenth segment 60 microns.

Head 1.8 times wider than long, flattened in front; cheeks straight. Back of head with conspicuous transverse, wavy lines, occipit line especially strong behind posterior ocelli. Four distinct spines on anterior margin of head, about as long as those in front of posterior ocelli. Eyes large, with coarse facets. Ocelli approximately as large as facets of eyes. Mouth cone short, reaching only four-fifths over prosternum, broad at base and rounded at tip.

Prothorax with three distinct spines on each posterior angle, the outer two small and curved, the inner one moderately long, about twelve spines scattered over pronotum. Pterothorax also with distinct lineations. Wings normal, fore vein with twenty-two spines, one near center of outer dark cross band where second vein should appear. Microscopic setae very close and prominent on the sides of abdominal segments but very faint in the center, comb-like arrangement of spines conspicuous at sides along posterior margins of segments one to seven, a complete comb on segment eight.

Type Material: Female holotype and two ♀ paratypes taken by sweeping, August 30, 1921, by Mr. R. C. Lange, after whom the species is named. Types in author's collection. (Moulton, No. 780.)

Type Locality: Fish Lake, Illinois.

This species is clearly separated from other members of the genus by its uniform body color and the banded wings with transparent tips.

Tribe *Dendrothripini* Priesner, 1926.

Anaphothrips crassicornis n. sp.

Female holotype: Color clear yellow with thorax and margins of femora and tibiae shaded a little darker. First antennal segment whitish, two clear yellow, three four and five yellowish white at base shading to gray brown at tip, six gray brown lighter at base, seven to nine gray brown. Wings yellow, prominent body and wing spines brown. Crescents of ocelli orange.

Total body length 1. mm.; head, length .09 mm., width .13 mm.; prothorax, length .10 mm., width .15 mm.; mesothorax, width .20 mm.; metathorax, width .18 mm. Antennae: length (width) I, 18 (21); II, ? (24); III, ? (21); IV, ? (21); V, 33 (21); VI, 30 (21); VII, 6 (15); VIII, 9; IX, 12; total length 180 (?) microns. Length of spines: a single one on each posterior angle of prothorax 30 μ , outer pair on posterior angle of ninth abdominal segment 75 μ , median inner pair 36 μ , median dorsal pair on tenth abdominal segment 60 microns.

Head transverse, broadly flattened in front; cheeks slightly arched, without prominent spines or markings. Eyes semi-spherical. Ocelli present but not strongly developed. Mouth cone broad at base, angular at pit, reaching posterior margin of prosternum. Antenna compact, approximately twice as

long as head, clearly with nine segments having a 3-segmented style.

Prothorax 1.5 wider than long with a single moderately stout spine at each posterior angle and a series of four on either side along posterior margin, about twenty short brown spines scattered over dorsum. Mesothorax broadest with sides strongly arched, metathorax smaller, especially where it joins mesothorax. Median dorsal pair of spines on metanotum, placed well back from anterior margin. Legs normal. Wings fully developed with spines as follows: costa 24, fore vein 1-3 at base followed by a short intermission, then a series of fifteen regularly placed spines reaching to tip, hind vein with 13.

Abdomen elongate-ovate, outer pair of spines on posterior margin of ninth segment clearly twice as long as the inner pair, spines on segment ten intermediate between the two. Fully developed comb along posterior margin of segment eight.

Allotype male: colored as in female. Total body length .9 mm. Antennae: length (width) I, 15 (15); II, 27 (24); III, 27 (18); IV, 30 (18); V, 30 (18); VI, 27 (61); VII, VIII and IX, 27. Spines on fore wings as follows: costa 19, fore vein 4-7-1-1, an intermission, 4 near tip, hind vein 9. Ninth abdominal segment with a median pair of short spurs 15 μ long, and a single spine on either side outward and anterior to these 27 μ .

Type Material: Female holotype, male allotype taken July 5, 1926 (W. M. Shackleford). Host plant unknown. Type in author's collection. (Moulton, No. 1647.)

Type Locality: Champagne County, Illinois.

This species is distinct from any previously described American species because of its compact and clearly 9-segmented antenna and the almost regular placement of spines on the fore-longitudinal vein of fore wings in the female. Intermediate antennal segments are somewhat more slender in the male and the intermissions in the arrangement of spines on the fore veins of fore wings are more distinct.

Subfamily *Thripinae* Karny.

Odontothrips loti Haliday.

Euthrips ulicis californicus Moulton, 1907. Thysanoptera of California, U. S. Dept. of Agric. Tec. Ser., No. 12, Pt. III, p. 55.)

Odontothrips californicus Moulton, 1927. (Pan.-Pac. Ent., Vol. IV, No. 1, page 34.)

I have been able to compare our American species with specimens of *O. loti* Hal., kindly sent to me by Dr. H. Priesner and find the two species identical. A wider distribution is also recorded from the following collections:

3 ♀♀ taken on *Lupinus argenteus* at Stillwater, Colorado, July 18, 1926, by Alvah L. Pearsall. (Moulton, No. 992.)

1 ♀ taken on *Malus* sp. at Colorado Springs, Colorado, May 14, 1926, by G. W. Goldsmith. (Moulton, No. 1158.)

1 ♀ taken on wild lucerne at Toga, Virginia, June 19, 1927, by J. V. Gilmore. (Moulton, No. 2090.)

Frankliniella insularis Franklin.

Numerous specimens taken on legumes and other unnamed plants at Bear Camp, Catalina Mountains, Arizona, on April 24, 1926, by Messrs. C. T. Vorhies and A. A. Nichols. (Moulton, Nos. 1856 and 1864.)

This record extends the range of this species to the south western states.

***Ctenothrips frosti* n. sp.**

(Brachypterous.)

Female, holotype. Color of head and thorax blackish brown, abdomen black, all femora blackish brown, light yellow at extreme base, tibiae dark brown, lighter along center, tarsi yellowish brown. Antennal segments one and two blackish brown, two lighter towards tip, three yellowish brown, four yellowish brown in basal third, dark brown in outer two-thirds, five yellowish brown at extreme base, shading to dark brown in outer half, six to eight blackish brown.

Total body length 1.76 mm.; head, length .19 mm., width across eyes .21 mm.; prothorax, length .15 mm., width .27 mm.; pterothorax, width .36 mm.; abdomen, width .54 mm. Segments of antennae: length (width) I, 30 (33); II, 42 (30); III, 87 (24); IV, 69 (24); V, 60 (21); VI, 81 (21); VII, 12; VIII, 24; total length 405 microns.

Head approximately as long as wide, constricted behind eyes but not as deeply as in *Ctenothrips bridwelli* Franklin. Back of head with coarse, transverse, anastomosing striations. All head spines relatively short, a pair anterior to ocelli and near anterior inner margins of eyes. Interocellars placed between posterior ocelli with a series of three or four on either side behind eyes. Eyes large, protruding, with coarse facets. Ocelli fully developed. Antennae normal to the genus.

The anastomosing transverse lines of prothorax much less distinct than on head, entire surface stippled with light colored dots, mesonotal plate more clearly lined than the pronotum and metanotum, distinctly reticulate. Lines on femora rather distinct, on tibiae hardly visible. Wings reduced to very short pads.

Abdomen broadly ovate, much wider than pterothorax, first segment clearly reticulated, eighth segment with fully developed, long-toothed comb.

Type Material: Female holotype taken by sifting, March 24, 1928, by Mr. C. A. Frost and named in his honor. Type in author's collection. (Moulton, No. 3066.)

Type Locality: Sherborn, Massachusetts.

This species is clearly separated from *reticulatus* Crawford, by the absence of conspicuous reticulations on the thorax and legs and may be separated from *bridwelli* Franklin, by the darker colored third, fourth and fifth antennal segments. It approaches *floridensis* Watson perhaps most closely, but this latter species is described as having the pronotum with deep polygonal reticulations which are very indistinct on the pronotum in this new species.

Taeniothrips dianthi Priesner.

Two female specimens taken on *Dianthus plumarius* at Vernon, British Columbia, Canada, June 3, 1927, by Mr. A. H. Ruhman (Moulton, No. 2047) and two specimens taken from *Dianthus* sp., July 4, 1927, at Shenandoah, Iowa, by Mr. S. C. Jones (Moulton, No. 2394).

This is the first finding of this species in North America, it having been known previously only in Central Europe.

Thrips discolor Halid.

One female taken from Buttercups, July 11, 1926, by Dr. W. E. Britton, Salisbury, Conn. (Moulton, No. 1124), and one specimen taken from Buttercups, July 5, 1926, by Mr. H. Notman, Keene Valley, New York (Moulton, No. 1240).

This is the first record for this thrips in North America, previously known only from Europe.

Thrips gilmorei n. sp.

Female, holotype. Body color deep brown with much red hypodermal pigment in thorax and abdomen. Segments one and two of antennae deep brown with red hypodermal pigment, three to seven clear yellow with a shade of brown in

basal quarter of segment three, distal half of six and all of seven light yellowish brown. Legs uniformly deep brown. Fore wings uniformly brown but clear in basal fifth. Crescents of ocelli deep orange red. All prominent body spines dark brown.

Total body length 1.5 mm.; head, length .15 mm., width .15 mm.; prothorax, length .14 mm., width .20 mm.; pterothorax, width .27 mm.; abdomen, width .28 mm. Segments of antennae: length (width) I, 24 (30); II, 33 (27); III, 57 (24); IV, 57 (21); V, 28 (18); VI, 60 (18); VII, 24; total length 300 microns. Length of spines: interocellars 21 μ , on posterior angles of prothorax 72 μ , outer pair on ninth abdominal segment 129 μ , inner 100 μ , on tenth abdominal segment 105 microns.

Head clearly as long as wide, constricted behind eyes and then somewhat swollen, with prominent broken transverse lines on back of head. Interocellar spines placed on a line connecting posterior ocelli with anterior ocellus. A series of three spines on either side behind eyes. Eyes prominent, with coarse facets, conspicuously pilose. Ocelli large. Antenna slender, twice as long as head.

Prothorax with two long spines at each posterior angle and two on either side along posterior margin, the innermost being about twice as long as the outer. A pair of well developed spines near center of metanotum, placed well back from anterior margin. Legs semi-reticulate and rather densely clothed with short dark spines. Wings fully developed, anterior vein with 3-3 basal bristles and three distal bristles, posterior vein with 14.

Abdomen long and slender, comb along posterior margin of eighth segment complete but weak, suture on tenth segment extending two-thirds its length.

Male allotype: Coloring as in the female. The first two antennal segments deep brown but showing more red hypodermal pigment, three to five yellowish but indistinctly light brown at the tips, six lighter in basal fourth, brownish yellow in outer three-fourths.

Total body length 1.2 mm.; length .14 mm., width .13 mm.; prothorax, length .10 mm., width .16 mm.; pterothorax, width .21 mm.; greatest width of abdomen .15 mm. Ventral depressions on sternites two and three large, ovoid in shape and rather conspicuous but appear to be wanting on other sternites.

Type Material: Female holotype and male allotype taken on hickory, June 22, 1927, by Mr. J. W. Gilmore, and named in his honor. Types in author's collection. (Moulton, No. 2093.)

Type Locality: Appomatox, Virginia.

This species would seem to be most closely related to *T. physapus* Linn., but is easily separated from that species by its relatively longer head, straighter cheeks and with little or no constriction at the base, also uniformly light color of the distal three-fourths of the third, fourth and fifth antennal segments in the female. *Gilmorei* is distinguished also by its uniformly dark brown legs, including the tarsi.

Thrips (Microcephalothrips) abdominalis Crawford (Syn. *Thrips gillettei* Moulton).

Numerous specimens of this species were found in a collection made on *Hymenopappus carolinense* on March 31, 1927, at Bastrop, Texas, by Mr. Hugh A. Duval (Moulton, No. 1832). The series included three males heretofore unknown so I am offering a brief description.

General color as in the female.

Total body length .7 mm.; head, length .066 mm., width across eyes .093 mm.; prothorax, length .096 mm., width .126 mm.; pterothorax, width .156 mm.; abdomen, width .15 mm. Segments of antennae: length (width) I, 15 (18); II, 21 (18); III, 27 (15); IV, 24 (15); V, 21 (14); VI, 33 (15); VII, 12; total length 170 microns.

General shape of head and thorax as in the female. Abdomen more slender, segments with irregular comb-like teeth along posterior margins, tergites faintly cross striate, ventral depressions on sternites three to seven very small, almost round, 10-12 μ in diameter.

TUBULIFERA, 1836.

Family PHLOEOTHIRIPIDAE Hood.

Subfamily *Phloeothripinae* Priesner.

Tribe *Hoplothripini* Priesner.

Cephalothrips elegans n. sp.

Female, holotype. Color yellowish brown, abdomen somewhat lighter, tube darker and concolorous with head, tips of fore femora, all tibiae and tarsi yellow. Antenna uniformly brown, except tip of segment two and basal half of three which are yellowish. Body spines clear yellow.

Total body length 1.5 mm. (abdomen distended); head, length .15 mm., width .13 mm.; prothorax, length .105 mm., width (including coxae) .18 mm.; tube length .108 mm., width at base .051 mm. Segments of antennae: length

(width) I, 21 (27); II, 39 (25); III, 39 (25); IV, 39 (25); V, 39 (24); VI, 39 (20); VII, 36 (18); VIII, 24; total length 276 microns. Length of spines: postoculars 45 μ , on anterior angles of prothorax 27 μ , mid-laterals 39 μ , on posterior angles, outer 48 μ , inner 39 μ , on ninth abdominal segment 150 μ , at end of tube 160 microns.

Head 1.2 longer than wide and 1.5 longer than prothorax, without conspicuous markings, flattened in front, cheeks slightly arched. Postocular spines fully as long as eyes, with dilated tips. Eyes moderately small. Ocelli present. Mouth cone short, extending two-thirds over prosternum. Antenna about 1.5 longer than head, all segments rather compact, segment three noticeably "V"-shaped, three to seven each with a pedicel, eight broadly and flatly joined to seven.

Prothorax only slightly wider than head, all normal spines, including those on anterior margins and mid-laterals present, with dilated tips. Sides of pterothorax narrowed posteriorly. Legs short, fore femora slightly thickened, fore tarsi apparently unarmed. Wings reduced to short pads. Abdomen long and slender, wing-holding-spines completely wanting. Tube .66 head's length. Spines on ninth and tenth segments 1.5 longer than two.

Type Material: Female holotype, one female paratype taken under Maple bark, April 5, 1926, by Mr. J. W. Gilmore. Types in author's collection. (Moulton, No. 1428.)

Type Locality: Clarksville, Tennessee.

This species is closely related to *C. errans* Moulton, but may be separated by the lighter and more yellowish color, the shorter and narrower fourth and fifth antennal segments and the smaller fore femora.

Thorybothrips yuccae n. sp.

Female, holotype: Body color uniformly dark brown; legs and all segments of antenna dark brown except base of third which is lighter. Wings transparent, prominent body spines whitish.

Total body length (abdomen normal) 2.0 mm.; head, length .266 mm., width behind eyes .166 mm., at posterior margin .20 mm.; prothorax, length .133 mm., width including coxae .383 mm.; pterothorax, width .366 mm.; tube, length .195 mm., width at base .081 mm., at tip .042 mm. Segments of antennae: length (width) I, 36 (36); II, 51 (36); III, 60 (39); IV, 60 (39); V, 54 (33); VI, 51 (30); VII, 60 (24); VIII, 54 (15); total length 410 microns.

Length of spines: postoculars $70\ \mu$, on anterior angles of prothorax $30\ \mu$, outer pair on posterior angles, $75\ \mu$, on ninth abdominal segment $156\ \mu$, on tip of tube 120 microns.

Head 1.3 longer than wide, narrowest across eyes, cheeks straight, diverging toward posterior margin where head is broadest, without conspicuous markings. Postocular spines long, with blunt tips, placed near sides and almost mid-way between posterior margin of eyes and posterior margin of head, other spines inconspicuous. Eyes not protruding, outer margin almost straight and joining cheeks evenly, occupying about .3 the head's length. Ocelli fully developed. Mouth cone short and broadly rounded, reaching two-thirds over prosternum. Antenna with eight segments, three to seven each with a distinct pedicel, three and four broadly clavate, subequal in length and width and broadest of all, eight more than three times as long as greatest width, clearly separated from seven, narrowed at base but without a distinct pedicel. Sense cones short and strong, segments three and four each with three and five and six each with two.

Prothorax .66 as long as head, clearly transverse, without conspicuous markings. Spines on anterior angles moderately developed with blunt tips, a prominent pair at each posterior angle, others vestigial. Pterothorax slightly narrower than prothorax including coxae, broadest in front with sides gradually converging toward the posterior. Fore femora greatly enlarged with outer distal margin slightly curved outward as in *Chirothrips manicatus*, Hal., fore tibia stout, each fore tarsus armed with a short, stout tooth in addition to a strong claw. Middle and hind legs moderately long. Wings fully developed, with parallel sides, fore pair with twenty double fringe hairs along posterior margin.

Abdomen normal. Tube .7 as long as head and twice as broad at base as at tip. Abdominal spines well developed but difficult to see because of their whitish color.

Type Material: Female holotype taken on *Yucca rupicola*, April 25, 1928, by Mr. Hugh H. Duval. Type in author's collection. (Moulton, No. 3242.)

Type Locality: Bastrop, Texas.

This species is interesting as it is the first member of the genus to be found in North America. It is easily distinguished by its uniformly dark brown antennae and legs in comparison with the European *T. graminis*, Priesner, which has the end of the fore tibiae and tarsi and the third antennal segment yellowish to yellowish gray.

Rhynchothrips versicolor n. sp.

Female, holotype. Body color dark chestnut brown except all tarsi which are yellowish, and third antennal segment which is yellow with a cloud of grayish brown in outer half, segments four to six mottled with yellow, all prominent body spines dark brown. Wings transparent except for a light brownish cloud at base.

Total body length 2.12 mm.; head, length .266 mm., width .233 mm.; prothorax, length .216 mm., width (without coxae) .333 mm., (including coxae) .383 mm.; pterothorax, width .433 mm.; abdomen, width .433 mm.; tube, length .25 mm., width at base .083 mm. Segments of antennae: length (width) I, 39; II, 60 (36); III, 81 (36); IV, 81 (39); V, 69 (39); VI, 60 (33); VII, 48 (30); VIII, 36; total length 510 microns. Length of spines: postoculars 69 μ , on anterior margin of prothorax 60 μ , on anterior angles 48 μ , mid-laterals 75 μ , on posterior angles, outer 150 μ , inner 135 μ , on ninth abdominal segment 210 μ , on tip of tube 210 microns.

Head 1.3 longer than width behind eyes, broadly flattened in front, cheeks slightly arched, somewhat narrowed toward the posterior, marked with transverse, wavy, anastomosing lines. Postocular spines stout, pointed, somewhat shorter than length of eyes. Eyes large and round. Ocelli well developed. Mouth cone stout, pointed, reaching to anterior margin of mesosternum. Antenna with segment eight clearly separated from seven but broadly joined. Sense area on segment two placed about one-third the segment's length from distal margin.

Prothorax transverse, .7 as long as head, sculpturing more or less distinct only at the sides. All normal spines well developed and with pointed tips, pair at posterior angles longest. Pterothorax with evenly formed and slightly arched sides. Legs moderately stout, fore femora somewhat thickened, fore tarsus with the usual claw, otherwise unarmed. Wings fully developed with parallel sides, each fore wing with 16 double fringe hairs along the posterior margin.

Abdomen of equal width with pterothorax. Tube .9 as long as head.

Both larvae and pupae have much dark red or purple pigment.

Type Material: Female holotype, one female paratype, three large larvae and four pupae taken in hickory galls June 22, 1927, by Mr. J. W. Gilmore. Types in author's collection. (Moulton, No. 2093.)

Type Locality: Appomatox, Virginia.

This species most closely resembles *R. ilex*, Moulton, but is distinguished by the lighter fourth and fifth antennal segments which are mottled in effect rather than shading gradually from yellow to yellowish brown as in *ilex*. This species also has longer third and fourth antennal segments, 81 μ as compared with 60 μ in *ilex* and a larger number of double fringe hairs on fore wings, 16 as compared with 8-10.

Lispthrips varicornis n. sp.

Female, holotype. Body color black, legs black except tarsi which are dark brown. Antennal segments one, two and six to eight almost black, two lighter at tip, three and four yellow with four slightly brownish in distal third, segment five deep brown with pedicel lighter.

Total body length 2.16 mm. (abdomen distended); head, length .219 mm., width .18 mm.; prothorax, length .18 mm., width .276 mm.; pterothorax, length .18 mm., width .33 mm.; abdomen, width .48 mm.; tube, length .165 mm. width at base .075 mm. Segments of antennae: length (width) I, 30 (36); II, 48 (36); III, 42 (30); IV, 45 (36); V, 42 (33); VI, 45 (28); VII, 48 (24); VIII, 36, total length 330 microns. Length of spines: postoculars 45 μ , on anterior angles of prothorax 30 μ , mid-laterals 33 μ , on posterior angles, outer 60 μ , inner 30 μ , on ninth abdominal segment 75 μ , at tip of tube 90 microns.

This species is typical of the genus with its short, compact antennae, segments three to seven each having a broad, distinct pedicel, segment three without sense cones, checks roughened and with three or four short, sharp transparent spines borne on small warts. The regular body spines are short, transparent and difficult to observe. Legs are short and stout.

It is easily separated from *L. birdi*, Moulton, by the following characters: Antennal segments three and four yellow, head more slender, with cheeks almost parallel and slightly constricted at base, mouth cone distinctly longer and more angular at tip, reaching two-thirds across prosternum.

Type Material: Female holotype taken on Black Willow (*Salix nigra*), April 17, 1927, by Mr. F. C. Bishopp. All types in author's collection. (Moulton, No. 2175.)

Type Locality: Menard Texas.

Only two species in this genus have been recognized up to this time and both are European, therefore it is interesting to record one new species in this paper and two others which are being described elsewhere, as new North American species.

Gynaikothrips uzeli Zimmermann.

One female and two male specimens taken on Red clover, September 3, 1927, at Atwater, Illinois, by Miss L. Blevins. (Moulton, No. 2317.)

This is an interesting record because it extends the distribution of the species much farther north than it has heretofore been known.

Hoplothrips kincaidi n. sp.

Female, holotype. Color including antennae and legs uniformly light brownish yellow except tube which is more distinctly yellow.

Total body length 2.16 mm.; head, length .233 mm., width .233 mm.; prothorax, length, .189 mm., width .36 mm.; pterothorax, width .38 mm.; abdomen, width .466 mm.; tube, length .183 mm. Distance between basal segments of antenna 15 m. Segments of antennae: length (width) I, 54 (48); II, 60 (39); III, 66 (42); IV, 66 (39); V, 66 (42); VII, 54 (33); VIII, 69 (24); total length 486 microns. Length of spines: postoculars 105 μ , on anterior angles of prothorax 63 μ , mid-laterals 36 μ , on posterior angles, outer 150 μ , inner 69 μ , on ninth abdominal segment 240 μ , at tip of tube 180 microns.

Head as wide as long, cheeks straight, slightly diverging posteriorly and broadest near posterior margin. Postocular spines almost half as long as head, sharply pointed like other prominent body bristles. Eyes extremely small with less than ten facets and only two on outer margin. Ocelli wanting. Mouth cone broadly rounded, labrum sharply pointed, reaching posterior margin of prosternum. Antennae 2.1 longer than head, segment eight with broad pedicel and clearly separated from seven.

Prothorax .8 as long as head and nearly twice as wide as median dorsal length of pronotum. Anterior marginal spines vestigial, those at anterior angles about half as long as outer pair at posterior margins. Legs moderately short, fore femora slightly thickened, each fore tarsus armed with a small tooth in addition to the usual claw. Wings wanting.

Abdomen somewhat broader than thorax. Tube .8 as long as head, clearly broader at base and narrowed in distal fourth.

Larvae clear to grayish white with tube somewhat darker.

Type Material: Female holotype, 5 female paratypes and two larvae taken under bark, November 1, 1927, by Mr. T. Kincaid after whom the species is named. Types in author's collection. (Moulton, No. 2572.)

Type Locality: Seabeek, Washington.

This species is closely related to *pedicularis*, Haliday from which it may be distinguished by its uniformly lighter color and by the whiter color of larvae. It may also be distinguished from *pergandei*, Hood by the sharply pointed body bristles. In *pergandei* these bristles have dilated tips.

Tribe *Docessissophothripini* Priessner, 1927.

Docessissophothrips* animus n. sp.

Male holotype. Color dark brown with head and tip of abdomen beyond seventh segment blackish. All legs and segments of antennae dark brown except basal two-thirds of three which is yellowish.

Total body length 3.32 mm.; head, length .54 mm., width .33 mm.; prothorax, length .12 mm., width including coxae .48 mm.; pterothorax, width .57 mm.; abdomen, width .57 mm.; tube, length .33 mm., width at base .12 mm., at tip .06 mm. Segments of antennae: length (width) I, 27 (45); II, 75 (48-60); III, 135 (42); IV, 105 (45); V, 108 (42); VI, 87 (45); VII, 51 (36); VIII, 63 (24); total length 660 microns. Length of spines: group of ante- and postocellar spines 99-120 μ , postoculars 90 μ (?), on posterior angles of prothorax, outer 120 μ , inner 90 μ , basal wing spines 60, 60 and 120 μ respectively, on ninth abdominal segment 240 μ , tip of tube 180 microns.

Head 1.7 longer than wide, smaller in front, swollen and elevated in the middle and somewhat reduced toward the posterior margin, with a pair of prominent spines on either side in front of each posterior ocellus, the inner one of which is almost in line between the posterior ocelli and the anterior ocellus and the outer one close to inner margin of eyes. There is also a smaller pair almost immediately behind and a little inward from posterior ocelli. The postocular spines are placed well back from eyes with a similar pair near median dorsal part of head, cheek spines small and inconspicuous. Eyes semi-crescent shaped around anterior angles of head, with small facets. Ocelli large, anterior ocellus directed forward, posterior ocelli approximate to inner posterior angles

* (*Docessissopho* = conceited, referring to the swollen head.)

of eyes. Mouth cone short and broadly rounded. Maxillary palpus with two segments, the distal segment with two short, sharp, spur-like spines, one at the extreme tip and one on the inner margin near tip, in addition there are several longer normal spines. The terminal segments of each labial palpus are also tipped with a pair of prominent spurs in addition to other normal spines. Larger maxillary stylus narrow, lanceolate, pointed and grooved. Antenna 1.16 longer than head, segment two normal in dorsal view but in side view rather broadly expanded on the inside near the middle and toward tip, segments six and seven normal in dorsal view but swollen and projecting on ventral side at tips and set with three or four prominent spines; segments six to eight clearly separated, each with a distinct pedicel. Sense cones short and pointed.

Prothorax .2 as long as head and four times as wide as long, deeply concave in front. All normal spines present, sharply pointed like other prominent head and body spines. Pterothorax with sides rather evenly formed and almost parallel. Fore femora only slightly larger than middle and hind femora. Fore tarsi unarmed. Wings fully developed, broad with parallel sides but moderately short, extending only to sixth abdominal segment, fore-pair with 18 double fringe hairs along posterior margin.

Abdomen from segments two to five about as wide as pterothorax, reduced gradually beyond the sixth. Tube .6 as long as head and three times as long as width at base, ninth segment extends back on either side, forming distinct scales over basal third of tube. Sixth abdominal segment with a pair of tube-like inwardly curved appendages which extend to beyond middle of segment seven.

Female allotype. Colored as in the male.

Total body length 2.86 mm.; head, length .60 mm., width .39 mm.; prothorax, length .15 mm.; width .51 mm.; pterothorax width .60 mm.; abdomen, width .69 mm.; tube, length .45 mm., width at base .11 mm. Segments of antennae: length (width) I, 60 (52); II, 75 (dorsal view 51, side view 75); III, 165 (49); IV, 135 (49); V, 120 (45). Length of spines: interocellar spines 120 μ , on ninth abdominal segment 330 μ , at tip of tube 240 microns.

Tube .7 as long as head.

Type Material: Male holotype taken July 11, 1925, by the writer while sweeping nettles in the hills above Mt. View, California (Moulton, No. 402), and female paratype taken by Mr. J. C.

Bridwell at Corvallis, Oregon, host plant and date not given. Types in author's collection. (Moulton, No. 249.)

Type Locality: Mt. View, California.

This species appears to be most closely related to *D. adiaphorus* Karny but is easily separated by its color, the latter having all tibiae and tarsi clear yellow. All the species of this genus have heretofore been recognized by individual female specimens and the finding of a male which has tube-like appendages on the sixth abdominal segment is extremely interesting because it removes this genus from the subfamily *Phloeothripinae*, Tribe *Docessissophothripini* (according to Dr. H. Priesner's Monograph of the Thysanoptera of Europe, 1926, p. 478), and places it clearly in the subfamily *Megathripinae*, Tribe *Megathripini*. After measuring the female paratype I demounted and dissected this specimen to observe the mouth parts and found the larger maxillary stylus clearly grooved, but unfortunately the second smaller organ was lost in the dissection.

The species is also close to *Siphonothrips elegans* Buffa but the shape of the head and eyes would seem to place it rather in the genus *Docessissophothrips*.

Paonias excaecatus in Colorado.—During the past summer a fine female *P. excaecatus* was taken at Boulder, Colorado. I was interested to see if it could be referred to the pale western race (*pecosensis* Ckll.) which I described (*Entomologist*, April, 1905) from New Mexico. Allowing for a reasonable amount of variation, I think it may be considered *pecosensis*, as it has the upper part of the dark median area pale and rosy, with the black spot very conspicuous, and the dark lines on the basal field are barely perceptible. The light post median bands are suffused and very obscure. The ocellus on hind wing is large and oblong, not circular, with the pale blue pupil comparatively large and transverse. In the case of *Automeris io*, Barnes and Benjamin distinguish a Colorado race, and a distinct one in New Mexico. It is quite possible that there are similarly two races of *P. excaecatus*, but it would be hazardous to affirm this without more material. Undoubtedly these sphingids produce local races under diverse climatic conditions, but these can only be adequately demonstrated by large series, which will only be obtained by breeding.—T. D. A. COCKERELL, Boulder, Colo.